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# Mechanics' Dictionary

*College of Alameda*

[RETURN TO DIESEL MECHANIC HOMEPAGE](#)

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## A

<b>APS</b>	Accelerator Pedal Sensor (Cummins) (see <a href="#">TPS</a> or <a href="#">EFPA</a> )
<b>Air-fuel Ratio</b>	The amount of fuel added to intake as compared by weight to air.
<b>Air Gap</b>	Space between two electrical contacts or pickups.
<b>Alternating Current</b>	(AC) A current passing through a series of positive and negative values to form a cycle.
<b>Ambient</b>	Surrounding atmosphere
<b>Ammeter</b>	Instrument used to measure current flow
<b>Ampere</b>	The practical unit of current measurement. Equal to the amount of electrical current required to produce 1 volt passing through a resistance of 1 ohm.
<b>Ampere Hour Capacity</b>	Term used to indicate the electrical capacity of a battery.
<b>Analog</b>	Computer digital in/output. Mathematical solutions using electrical voltages as numerical variables. Output varies as a continuous function of the input, i.e., computer program.
<b>Anode</b>	Positive terminal
<b>Armature</b>	A portion of an electrical device that moves within the flux of field windings, as in a starter motor.
<b>Atmospheric Pressure</b>	The weight of the earth's atmosphere, approximately 14.7 psi at sea level.
<b>Atomize</b>	Reduction of liquid fuel into small droplets for better mixing with air.

<b>Atom</b>	Basic atomic unit. The smallest part a substance can be separated do to. Molecules are made up of atoms. Water (H <sub>2</sub> O) contains two hydrogen atoms and one oxygen atoms.
<b>Axle (Drive Axle)</b>	The third-member of the drive train. An axle that drives the wheel axles, e.g., contains the ring and pinion gears.
<b>Axle (Foundation Axle)</b>	The support member of the vehicle, i.e., front axle or steering axle. Three axle truck could have a front axle and two rear axles.
<b>Axle (Wheel Axle)</b>	The shaft that turns the wheel. Full-floating wheel axles do not support the weight of the vehicle, semi-floating axles do support the weight of the vehicle.

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## B

<b>Backlash</b>	Play in-between the gears.
<b>Base</b>	Part of a transistor. The portion of a transistor used to control current flow through the emitter and collector.
<b>Battery</b>	A dc voltage source that converts chemical energy into electrical energy.
<b>Bit</b>	Computer term for the smallest element of information in binary language.
<b>Box</b>	A generic term for a case in a vehicle, i.e., steering box, transmission, rear axle.
<b>BPS</b>	Boost Pressure Sensor (Cummins) (For Detroit see <a href="#">TBS</a> )
<b>Byte or Bite</b>	Contiguous bits to form a fundamental character storing unit i.e. 16 bit or 32 bit.

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## C

<b>Camber</b>	Angle the wheel leans in or out-board of the vehicle.
<b>Caster</b>	Angle the axle is tilted forward or rear-ward.
<b>Capacitor</b>	A device constructed by separating two conductors with a dielectric. It has the ability to store an electrical charge in

	the dielectric.
<b>Card</b>	An electronic circuit board fits into the CPU.
<b>Catalyst</b>	A material that causes a chemical reaction between two compounds, without itself being affected.
<b>Cathode</b>	The negative terminal
<b>Chip</b>	A silicone section containing all the elements of a complex electrical circuit.
<b>Circuit Breaker</b>	A resetable fuse for an electrical circuit.
<b>CLS</b>	Coolant Level Sensor
<b>Collector</b>	One of the current-carrying poles of a transistor.
<b>Computer or CPU</b>	A device capable of receiving electrical information, applying programmed processes to the information, and issuing a result.
<b>Compressed Natural Gas (CNG)</b>	CNG is natural gas. Natural gas is a mixture that is used as a fuel source. To create vehicle range CNG is compressed to 3600 psi.
<b>CTS</b>	Coolant Temperature Sensor
<b>Cubic Inch Displacement (CID)</b>	The volume of the piston cylinder or total engine, i.e., Detroit 92 is 92 cubic in. per cylinder, metric is in liters, i.e. 855 Cummins is a 14L.

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## D

<b>Data Link</b>	Information line for the computer to communicate with other devices or computers, i.e., J1587 and J1939.
<b>Detonation</b>	The sound created by excessive pressures in the combustion chamber during combustion.
<b>Dielectric</b>	A nonconductor, an insulator.
<b>Digital Computer</b>	A computer that receives information and issues commands in binary language form. Digital forms are on-off signals represented in square-wave pattern.
<b>Diode</b>	A device that has a high resistance to current flow in one direction and a low resistance in the opposite direction.
<b>Direct</b>	DC - An electrical current that flows in one direction.

## Current

<b>Dolly</b>	An axle to with a coupling device to convert a semi-trailer to a full trailer.
<b>Duty Cycle</b>	The amount of time electrical current flows through a circuit as compared to the amount of time the circuit is open. A 50 percent duty cycle indicates that a circuit is live for the same length of time it is de-energized.
<b>Dwell</b>	The duty cycle represented in terms of angular degrees. Also, referred to as (distributor) cam angle. The angle the point are closed.

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## E

<b>Economizer</b>	Sometimes called a power valve. Used to meter fuel discharge in relation to manifold vacuum.
<b>EEPROM</b>	Electronic Erasable Programable Read Only Memory (see <a href="#">PROM</a> and <a href="#">Memory</a> )
<b>EFPA</b>	Electronic Foot Pedal Assemble - contains the <a href="#">TPS</a>
<b>Electrode</b>	An electrical conductor within a device. The center core of a spark plug.
<b>Electrolyte</b>	Battery acid having 1.300 molar rating of $H_2SO_4$ (sulfuric acid). Any substance that forms ions when placed in the proper environment forms a conductor of electricity.
<b>Electromagnet</b>	An insulated coil usually surrounding an iron core that is magnetized by electric current.
<b>Electromagnetic Interference</b>	(EMF): A magnetic distortion created by high-voltage carriers that interfere with electronic reception and transmission devices. Sometimes called radio-frequency interference (RFI).
<b>Electromotive Force</b>	(EMF): A difference in electrical potential that causes the flow of current.
<b>Electron</b>	A fundamental part of an atom. It carries a negative charge of one electronic unit.

<b>Electronic Unit Injector</b>	An injector that is controlled by electricity.
<b>Engine Brake</b>	A device used to slow the vehicle down by counteracting the engine's power, i.e., Jake Brake, C Brake, Exhaust Brake.
<b>Emitter</b>	A current-carrying pole of a transistor connected to the collector by controlling the base.
<b>EPS</b>	Engine Positioning Sensor (Cummins)
<b>ESS</b>	Engine Speed Sensor (Cummins)
<b>FTS</b>	Fuel Temperature Sensor

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## F

<b>Fault Codes</b>	Codes generated by the <a href="#">ECM</a> to show a failure.
<b>Field</b>	The area affected by lines of magnetic force.
<b>Fifth Wheel</b>	Coupling device to mount a semi-trailer to a tractor or dolly.
<b>Float Level</b>	The level of fuel in the bowl required to force the float arm against the carburetor needle and seat.
<b>Flux</b>	Electric or magnetic lines of force in magnetic field.
<b>Force</b>	Push, pull, or a twist
<b>FPCM</b>	Fuel Pump Control Module is a stand-alone computer controlled system used in Europe and is used in combination with a ECM on Cummins ISB engines.
<b>Frequency</b>	The number of cycles or alternations occurring in 1 second. Measured in terms of cycles per second (cps) or more commonly hertz (Hz).
<b>Fuse</b>	An over-current protective device. A wire capable of carrying a specific maximum current. Exceeding the maximum causes the wire to thermally self-destruct.

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## G

<b>Gear Ratio</b>	Amount of turns the driven gear turns the drive gear one revolution.
<b>Glad Hands</b>	Air coupling devices from truck to trailer i.e. supply glad hand or service glad hand.
<b>Grid</b>	A metal mesh-like screen used for electrical heating or conductance. Battery cell plates are grids.
<b>Ground</b>	Most modern vehicles use a negative ground electrical system. The negative terminal of a battery and electrical device connected to the chassis metalwork.
<b>Growler</b>	An instrument used to check armatures.
<b>GVW or Gross Vehicle Weight</b>	Weight of vehicle and total capacity load together.

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## H

<b>Hall Effect</b>	The generation of a square-wave electrical signal, using a magnetic field to switch the base of a transistor.
<b>Hardware</b>	The physical components that comprise a computer system. Mechanical, magnetic, and electronic devices in a system (CPU, Monitor, Keyboard).
<b>Heat Riser</b>	The flow of hot exhaust gases in a passage beneath the runners of an intake manifold.
<b>Heat Sink</b>	A surface used to dissipate heat. Metal mounting surface in electrical devices used to dissipate heat in the device, i.e., diode bridge.
<b>Hertz</b>	(Hz): The number of cycles completed in a unit of time, i.e., 60 Hz is 60 cycles in 1 second.
<b>Horsepower</b>	Unit of measure equal to lift 33,000 pound one foot in one minute.
<b>Hydrocarbon</b>	A substance composed of carbon and hydrogen (petroleum derivatives, i.e. diesel, gasoline, natural gas, propane fuels).
<b>Hydrometer</b>	A device for determining a battery's state of charge by measuring the specific gravity of the electrolyte.

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# I

<b>ICV</b>	Injection control valve used on Cummins ISB engines used with <a href="#">PCV</a>
<b>Impedance</b>	The total resistance of an electrical circuit or component. It is expressed in ohms.
<b>Induction</b>	The reaction of two different magnetic fields upon each other that are not electrically connected.
<b>Injector</b>	A solenoid or pop-off device that is used to supply metered amounts of fuel. See <a href="#">EUI - Electronic Unit Injector</a>
<b>Inner Base Circle</b>	Camshaft geometry - the part of the camshaft lobe when the injector is returning fuel to the tank.
<b>Insulator</b>	A nonconductive material used to isolate an electrical circuit. The properties of an insulator are determined by its dielectric strength.
<b>Integrated Circuit</b>	The combining of several interconnected electrical circuits within the confines of a single block of material. An example is the imprinting of circuits onto a substrate of a silicon wafer.
<b>Inverse Voltage</b>	The voltage across a rectifier during the half-cycle when current does not flow.
<b>ISB</b>	Interact System for the "B" series engine (Cummins)
<b>IMTS</b>	Intake Manifold Temperature Sensor (Cummins)
<b>IVS</b>	Idle Validation Switch (IVS) found in the throttle assembly (Cummins)

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# J

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# K

<b>Kilo</b>	One thousand, i.e., (Kv) kilo-volt is one thousand volts, kilo ohms is one thousand ohms
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**Kingpin** The pin the couples into the fifth wheel or the pin that connects the front axles with the pivot.

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## L

**Light emitting Diode** (LED): A diode constructed in such a way as to generate a source when biased in a forward direction.

**Load** The amount of energy demand placed on an engine with a throttle valve. Manifold vacuum losses determine the extent of load.

**Logic (Computer)** A system of processing information where each function is affected by the preceding function.

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## M

**Magnet (Permanent)** A ferrite material charged to maintain a constant magnetic field.

**MEGA (M)** One million, i.e., Mv is one million volts, M ohm is one million ohms

**Memory** That portion of a computer used to store information for retrieval at a later date, i.e., ROM (read-only-memory) or RAM (random-access-memory)

**Microfarad** The practical unit of measurement for capacitance.

**Microprocessor** The basic form of a computer used to perform logic functions. The [CPU](#) chip in the computer.

**Milli** Prefix for indicating one-thousandth of a specified unit.  
Example: 20 millivolts = 0.020 volts.

**Micro** Prefix for indicating one-millionth of a specified unit.  
Example 20 micovolts = 0.0000020 volts.

**Modulate** A constantly changing control. Reacting to opposing influences. Example: The opening and closing of a back-pressure transduced EGR valve.

**Monolithic** A structure composed of a single rigid substance.



Example: The catalytic element of a monolithic converter.

**Multiplexing** The sending or receiving of several electrical or light frequency signals through a single conductor or a master computer controlling other system computers.

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## N

**Nitrogen Oxides (NO<sub>x</sub>)** The combining of nitrogen with free oxygen. A pollutant generated by excessive combustion chamber temperatures. A major contributor to smog.

**Noise (electrical)** Electrical disturbance usually caused by excessive electromagnetic interference.

**Normally Open or Closed** Describes the conductive position of a switch or relay while in the rest or de-energized position.

**NPN Transistor** A transistor constructed with a P-type base and N-type collector and emitter.

**N-Type Material** A semiconductor material with impurities added to give it a majority of electrons as charge carriers.

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## O

**Ohm** The unit of measurement for electrical resistance.

**Open Circuit** A circuit not capable of conducting current flow.

**OPS** Oil Pressure Sensor

**Oscilloscope** A device containing a viewing screen that displays electrical output in the form of quantity (voltage) and time.

**OTS** Oil Temperature Sensor

**Outer Base Circle** Camshaft geometry - the part of the camshaft lobe when there is injection and the injector is held closed to prevent combustion gases from entering.

**Oxidize** To combine with oxygen. Example: CO combined with O yields CO<sub>2</sub>

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# P

<b>PCV</b>	Pumping Control Valve used with <a href="#">ICV</a> found on Cummins ISC engines.
<b>Piezoelectric</b>	A crystal-type device that generates a small voltage when placed under mechanical stress. A detonation sensor can be piezoelectric.
<b>Pintle Hook</b>	Connector for the eye of a draw-bar on a dolly.
<b>PNP Transistor</b>	A transistor constructed with an N-type base and P-type collector and emitter.
<b>Polarity</b>	The arrangement of north and south poles in a magnetic field. Positive and negative direction of electrical current flow.
<b>Port</b>	Cylinder head passage for intake or exhaust charges. Is also an address in the computer for devices.
<b>Potential</b>	The ability to deliver power or force, i.e., the difference in voltage between two points in a circuit.
<b>Potential Drop</b>	Voltage Drop - The loss of voltage due to resistance between two points in a circuit.
<b>Power Train</b>	Components to deliver engine power to the wheels i.e. engine, transmission and rear end.
<b>PTO or Power Take Off Unit</b>	device that transmit engine power to an auxiliary device i.e. winches, pumps.
<b>Preignition</b>	Combustion being initiated prior to predetermined cylinder pressure levels.
<b>Primary Circuit</b>	Low voltage wiring used to supply current to ignition coil.
<b>Prom</b>	Programmable read only memory (PROM). A section of the computer used to contain information for input and output control. Generally used to tailor a computer to a particular model application.
<b>P-Type Material</b>	A semiconductor material with impurities added to produce free holes in the material.

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## Q

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## R

- Rectifier** A device that has the ability to convert [AC](#) to [DC](#).
- Regulator** Component capable of controlling pressure. The pressure can be hydraulic, fuel, or electrical.
- Relay** A device used to open or close an electrical circuit. Allows the switching of a high-current circuit with a low-current signal. A transistor is similar in operation to a relay.
- Resistance** The opposition to electrical flow in a circuit or component.
- Retard** The moving the point of ignition from the advanced position toward piston top dead center (TDC).
- RFI** Radio-frequency interference. See electromagnetic interference.
- Rise Time** The amount of time for coil saturation to reach 90 percent of potential.
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## S

- Saturation** A circuit condition that does not change output when input is increased.
- Secondary Voltage** The high voltage delivered to the spark plugs when current flow in the primary circuit is interrupted.
- Semiconductor** A device that can operate as a conductor or nonconductor, depending on the polarity of the applied voltage.  
A rectifier.
- Sensor** Signaling device to the computer or device to indicate output.
- Short Circuit** A circuit that does not follow its intended path.  
An example: The unwanted grounding of a conductor.
- Signal** An electrical, luminescent, physical, or audible indication used to convey information.
- Software** The language and procedures used to program a

	computer.
<b>Solenoid</b>	An electromagnetic device used to control electrical, pressure, or mechanical operation that include mechanical movement, i.e., Delco starter solenoids.
<b>Solid State</b>	Micro-circuit components constructed with semiconductors, i.e., 10SI Delco alternator regulators. (SI means solid state internal regulator)
<b>Spark Advance</b>	The positioning of ignition timing in relation to crankshaft position. Example 10TDC is 10 degree of rotation before top dead center.
<b>Specific Gravity</b>	Relative weight of substance as compared to the weight of water.
<b>SRS</b>	Synchronous Reference Sensor (Detroit)
<b>Stator</b>	Windings that create alternating current in relation to armature (reluctor) movement.
<b>Syncro or Synchronizer</b>	A device to bring components to the same speed.

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## T

<b>Tach Terminal</b>	A terminal use to gain the signal for RPM of the engine, i.e., Negative side of coil used to indicate rpm or ESS (sensor) on Cummins gives the computer a RPM signal.
<b>TBS</b>	Turbocharger Boost Sensor (Detroit) (Cummins see <a href="#">BPS</a> )
<b>Thermactor</b>	Air intake temperature control, i.e., air cleaner systems (TCA).
<b>Thermal resistor</b>	A device that changes resistance in relation to temperature, i.e., Resistance increases as temperature rises.
<b>Termination Resistance</b>	Resistance and the end of datalinks to verify to the computer that the information line is valid, i.e., Cummins Termination Resistance on the J1939 off the A plug (circuits 52, 12 and the return circuit 44)
<b>Thermistor</b>	A solid-state sensor or device that changes resistance in relation to temperature, i.e., CTS sensor resistance

decreases as temperature increases.

**Torque**

A twisting force, i.e., pound per foot or ft/lb.

**Toe-In**

The alignment angle that a set of axle tires will point in.

**TPS**

Throttle Position Sensor for electronic controlled throttles

**Tractor or****Truck Tractor**

A vehicle to pull semi-trailers.

**Transducer**

A device that receives energy from one system and transmits it to another system. The transmission may or may not be in a different form. Example: A manifold pressure sensor converts vacuum into an electrical signal and sends the signal to a computer system.

**Transient  
Voltage**

Voltage levels that exceed the maximum capacity of a circuit. Often called a spike, it can easily destroy solid-state components.

**Transistor**

A small semiconductor device originally designed to replace the vacuum tube. Its operation is similar to that of a relay.

**TRS**

Timing Reference Sensor (Detroit)

**Truck**

A vehicle that carries a self contained payload.

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## U

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## V

**Vacuum**

Any pressure less than the ambient atmospheric pressure.  
Negative pressure.

**Vapor Lock**

The percolation (boiling) of fuel that causes gaseous vapors to affect the development of pressure in the fuel system.

**Venturi**

An aerodynamic restriction that creates a surface vacuum zone relative to the velocity of air passing over the restriction.

**Volatility**

The ability of a liquid to enter a gaseous state. Evaporative property.

**Volt**

A unit of electrical force required to cause a current of 1 ampere to flow through a resistance of 1 ohm.

<b>Voltage Regulator</b>	A device used to control charging system voltage output.
<b>Voltmeter</b>	An instrument used to measure electrical pressure (voltage) in a circuit.
<b>VSS</b>	Vehicle Speed Sensor

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## W

<b>Watt</b>	The amount of electrical power needed to do work at a rate of 1 joule/second. Watts = amperes x volts.
<b>Wave Form</b>	Describes a continuous signal type. Square-wave forms are digital. AC waves are analog.
<b>Wheel Base (WB)</b>	The distance between the front and rear axles for tandem rear axle it is the midway line to the front axles.

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## X

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## Y

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## Z

<b>Zener Diode</b>	A diode that conducts when reverse voltage reaches a predetermined value.
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For corrections please contact [Mike Robertson](#)

Thank you

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